

### ABSTRACT OF THE DISCLOSURE

An apparatus and method for displaying a three-dimensional image provides a three-dimensional image having a wide viewing angle and having no distortion. The apparatus includes an aspectogram containing a plurality of two-dimensional microimages displayed in real time, a microlens array for synthesizing the two-dimensional microimages and regenerating them in a three-dimensional image, a head tracking system for tracing movement of an observer head that observes the three-dimensional image, in real time, a head position detector for calculating the position of the observer head traced by the head tracking system, an aspectogram regeneration engine for regenerating the microimages in accordance with a signal input from the head position detector to compensate distortion of the three-dimensional image, and a viewing adjust engine for adjusting a viewing zone of the three-dimensional image by moving the regenerated microimages to form a new viewing zone centered relative to the moved observer head in accordance with a signal input from the head position detector and the aspectogram regeneration engine. Thus, the three-dimensional image having no distortion can be observed without limitations imposed by a restricted size of the viewing zone.